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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/963,340	09/24/2001	Mark A. Conkling	5051.338CT	1188

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EXAMINER	
KALLIS, RUSSELL	

ART UNIT	PAPER NUMBER
1638	

DATE MAILED: 07/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/963,340	CONKLING ET AL.	
	Examiner	Art Unit	
	Russell Kallis	1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 January 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,12,13,16-19,26,31-33,43-45,57,61,62 and 94-107* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,12,13,16-19,26,31-33,43-45,57,61,62 and 94-107* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 October 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *see continuation*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

01/02; 10/08; 10/22; 09/16

DETAILED ACTION

Claims 94-107 are new. Claims 1-3, 12-13, 16-19, 26, 31-33, 43-45, 57, 61, 62 and 94-107 are pending and examined.

Rejection of Claims 1-13, 16-25 and 27-56 under 35 U:S.C. 112, second paragraph is withdrawn in view of Applicant's amendments.

Rejection of Claims 1-2 under 35 U.S.C. 102(b) is withdrawn in view of Applicant's amendments.

Claim Objections

Claims 32-33 are objected to because of the following informalities: Claims 32-33, the claims are improperly dependent. Claim 31 is not a method claim.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

Claims 1-3, 12-13, 16-19, 43-45, 57, 61-62 and 94-107 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This is a NEW MATTER rejection.

The added claimed material which is not supported by the original disclosure is as follows: Amended Claim 1 and new Claims 94-107 recites a nucleic acid greater than or equal to 30, 50, 75, 100, 125, 150 and 200 consecutive nucleotides of SEQ ID NO: 1. Thus, the claims are drawn to NEW MATTER. Applicant is invited to point to the page and line number in the

specification where support can be found. Absent of such support, Applicant is required to cancel the new matter in the reply to this Office Action.

Claims 1-3, 12-13, 16-19, 26, 31-33, 43-45, 57, 61, and 62 remain and new Claims 94-107 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This rejection is maintained for the reasons of record set forth in the Official action mailed 4/08/2004. Applicant's arguments filed 10/08/2004 have been considered but are not deemed persuasive.

Applicant asserts that the claims have been amended to claim fragments of a QTPase nucleic acid (response page 10). Actually, Applicant has deleted QTPase activity as a limitation in the claims. Currently the claims are drawn to SEQ ID NO: 1 and fragments of SEQ ID NO: 1.

Applicant asserts that the claims are directed to a class of molecules defined by their sequence (response page 11). Since Applicant has not described a structure shared in common between the claimed fragments and that is correlated with the claimed antisense activity, the written description requirement has not been satisfied.

Claims 1-3, 12-13, 16-19, 26, 31-33, 43-45, 57, 61, and 62 remain and new Claims 94-107 are rejected rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for SEQ ID NO: 1 encoding SEQ ID NO: 2, tobacco plants transformed with an antisense copy of SEQ ID NO: 1, a method of reducing QPRTase expression in transformed tobacco cells and tobacco plants, and a method of reducing nicotine levels in tobacco plants transformed with an antisense DNA of SEQ ID NO: 1, does not reasonably provide enablement

for using any DNA sequence encoding any QPRTase or any portion or segment thereof, or a method of reducing QPRTase expression or nicotine levels in any plant other than a method of reducing QPRTase expression in a tobacco plant transformed with antisense DNA of SEQ ID NO: 1 and transformed tobacco plants therewith. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims. This rejection is maintained for the reasons of record set forth in the Official action mailed 4/08/2004. Applicant's arguments filed 10/08/2004 have been considered but are not deemed persuasive.

Applicant asserts that the application of the claimed invention (current technology) requires routine effort (response page 12). Given the lack of working examples for fragments as small as 30 nucleotides in length acting to suppress activity the degree of unpredictability is high. Further, the invention should find support in the specification and not rely upon those of skill in the art. See *In re Fisher,* 166 USPQ 18, 24(CCPA 1970) which teaches "That paragraph (35 USC 112, first) requires that the scope of the claims must bear a reasonable correlation to the scope of enablement provided by the specification to persons of ordinary skill in the art. In cases involving predictable factors, such as mechanical or electrical elements, a single embodiment provides broad enablement in the sense that, once imagined, other embodiments can be made without difficulty and their performance characteristics predicted by resort to known scientific laws. In cases involving unpredictable factors, such as most chemical reactions and physiological activity, the scope of enablement obviously varies inversely with the degree of unpredictability of the factors involved." Moreover, Applicant cannot rely upon one of skill in the art given the lack of guidance in the specification and the limited scope of Applicant's disclosure with respect

to the claimed fragments and plants transformed therewith. See *Genentech, Inc. v. Novo Nordisk, A/S*, 42 USPQ2d 1001, 1005 (Fed. Cir. 1997), which teaches that disclosure of a "mere germ of an idea does not constitute [an] enabling disclosure", and that "the specification, not the knowledge of one skilled in the art" must supply the enabling aspects of the invention.

The specification fails to provide guidance for portions or segments of any QPRTase encoding DNA sequence, or which 5' and 3' untranslated regions thereof, that would enable the methods of the claims.

The state of the art for manipulation of plant metabolism/phenotype using transgenes is highly unpredictable in any particular plant species where the DNA sequences required to affect that aspect of metabolism are not taught and would require using known orthologous genes. Even a careful consideration of the likely reduction in sequence identity or homology of the transgene or portions of the transgene to the target gene in closely or distantly related species, uncharacterized with respect to the number of target gene isoforms or the specific degree of sequence identity between the transgene or parts of the transgene and the endogenously expressed DNA sequence, cannot reliably predict the biochemical properties or interactions of the transgene and endogenous gene product and hence the phenotype from expression of a particular transgene or transgene portion cannot be reliably predicted (Wu K. *et al.*, Plant Physiology, 1997, Vol. 114, pp. 1421-1431; page 1430 column 1, lines 11-27 and last paragraph lines 5-9). For example, antisense expression of a *gchs2* gene resulted in only partial reduction of *gchs3* and *gchs1* isoforms of the gene in transgenic *Gerbera hybrida* (Elomaa P. *et al.*, Molecular Breeding 1996, Vol. 2, pp. 41-50; on page 48, column 2 lines 4-10). Similarly, the co-suppression of gene expression is dependent upon a high degree or at least a recognizable degree

of sequence identity or homology between transgene and target sequence (Waterhouse P. *et al.*, Trends in Plant Sciences, November 1999, Vol. 4, No. 11 pp. 452-457; page 453 column 1 lines 32-40).

Applicant is invited, pursuant to the interview of 7/28/2004, to submit a declaration with data showing evidence of antisense fragments of SEQ ID NO: 1 as small as 30 consecutive nucleotides that suppress expression when transformed into tobacco.

Based upon Applicant's limited guidance one cannot predict which embodiments would be operable and thus undue trial and error experimentation would be required by one of skill in the art to isolate and test the multitude of non-exemplified DNA fragments and screen a myriad of non-exemplified transformed plants from any species for reduced QPRTase expression and nicotine content encompassed by the claims.

Given the unpredictability in the art as to which portions or segments of SEQ ID NO: 1 when transformed into tobacco would reduce expression of an endogenous QPRTase and reduce nicotine levels; the breadth of the claims encompassing any fragment as small as 30 consecutive nucleotides of SEQ ID NO: 1 when transformed into tobacco would reduce QPRTase expression or yiled reduced levels of nicotine; the lack of guidance in the examples of the specification or in the prior art as to which nucleotide sfragments, or portions or segments thereof, would reduce QPRTase expression levels or reduce levels of nicotine in a transformed tobacco; and the undue trial and error experimentation required to practice the claimed invention, the invention is not enabled for the scope set forth in the claims.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 44 remains and amended claims 26, 43 and 45 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. This rejection is maintained for the reasons of record set forth in the Official action mailed 4/08/2004. Applicant's arguments filed 10/08/2004 have been considered but are not deemed persuasive.

The claimed inventions encompass untransformed plants and seeds, which are a product of nature and not one of the five classes of patentable subject matter. Claims 26 43-44 and 45 are drawn to untransformed progeny or untransformed seed of the transformed plant. Due to Mendelian inheritance of genes, a single gene introduced into a parent plant would only be transferred at most to half the male gametes and half the female gametes. This translates into only two thirds of the progeny having at least a single copy of the transgene and one quarter of the progeny would not carry a copy of the transgene. Since the claim encompasses progeny that lack the transgene, the claim encompasses plants and seeds that are indistinguishable from plants and seeds that would occur in nature. See *American Wood v. Fiber Distintegrating Co.*, 90 U.S. 566 (1974), *American Fruit Growers v. Brogdex Co.*, 283 U.S. 2 (1931), *Funk Brothers Seed Co. v. Kalo Inoculant Co.*, 33 U.S. 127 (1948), *Diamond v. Chakrabarty*, 206 USPQ 193 (1980).

Applicant asserts that ¼ of the seeds produced would be wild type (i.e. not comprising the transgene) (response page 13). Since ¼ of the seeds would be untransformed those claimed seeds would read upon a product of nature.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-3, 12-13, 16-19, 26, 31, 43-45 and 57 remain and new claims 94-107 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-32 of U.S. Patent No. 6,586,661 B1. Although the conflicting claims are not identical, they are not patentably distinct from each other because they are both directed to an isolated DNA comprising the DNA sequence of SEQ ID NO: 1 which encodes a quinolate phosphoribosyl transferase enzyme, a DNA construct thereof, transgenic plants and seeds transformed therewith, methods of transforming plants and plant cells with SEQ ID NO: 1 and of reducing expression of quinolate phosphoribosyl transferase expression in a plant cell or plant transformed with SEQ ID NO: 1 in sense or antisense orientation, and a method of reducing nicotine levels in tobacco transformed with an antisense construct comprising SEQ ID NO: 1.

Applicant asserts that they would like an explanation of the relevance of the rejection in view of the amended claims (response of June 6, 2005 page 2). See arguments supra.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

All claims are rejected.

The Claims are deemed free of the prior art given the failure of the prior art to teach or suggest DNA sequences encoding a QPRTase and methods of making plant cells and plants transformed therewith wherein the levels of QPRTase or nicotine are reduced.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Russell Kallis whose telephone number is (571) 272-0798. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg can be reached on (571) 272-0975. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RUSSELL P. KALLIS, PH.D.
PRIMARY EXAMINER

Russell Kallis Ph.D.
July 10, 2006